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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,578	09/16/2003	Syamal K. Ghosh	86896RLO	2991

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EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

ART UNIT

PAPER NUMBER

1732

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,578

Applicant(s)

GHOSH ET AL.

Examiner

Jeff Wollschlager

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

The amendment to the claims filed April 17, 2006 has been entered. Claims 11-13 have been cancelled. Claims 1-10 are pending. The 35 U.S.C. 112 second paragraph rejection of claims 9 and 11-13 has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (European Patent Application 1 274 136; published January 8, 2003) in view of Shi (European Patent Application 1 156 536; published November 21, 2001).

With regard to claim 1, Van Slyke et al. teach a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition to produce an organic layer on a substrate for use in an organic light-emitting device comprising: combining organic materials in a powder form, such materials including at least one dopant component and one host component (Figure 9), using a mixing mechanism to form a homogeneous mixture of powder organic materials (paragraph [0020]) and compacting the homogeneous mixture of organic powder to form a pellet suitable for thermal physical vaporization to produce an organic layer on a substrate for use in an organic light-emitting device (Figure 9).

Further, Van Slyke et al. teach that organic powders used in thermal physical vapor deposition have a high propensity to entrain air and/or moisture between particles under ambient conditions and that it is required to outgas a charge of organic powders placed into a vapor deposition chamber through preheating the powder at a reduced pressure (paragraph [0009]).

Van Slyke et al. do not teach filling the container with an inert atmosphere and heating the powders in the inert atmosphere.

However, Shi teaches a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition producing an organic layer on a substrate for use in an organic light-emitting device comprising: combining organic materials in powder form, such materials

including at least one dopant component and one host component, heating the organic materials in the container in an inert atmosphere and mixing the organic materials to form a homogeneous mixture of organic materials (paragraphs [0032-0033]).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to modify the method of Van Slyke et al. with the inerting and heating step of Shi because the mixing method taught by Shi provides specific teaching for the generic mixing method taught by Van Slyke et al. Further, providing a chemically non-reactive atmosphere within a heated mixing vessel would prevent decomposition of materials, as demonstrated by Van Slyke et al. in his use of an inerted shroud during his molding step (paragraph [0040]). Further, one having ordinary skill would be motivated to inert the container to prevent a flash fire in the mixing vessel by breaking the fire triangle.

Additionally, determining the exact lengths of time, temperature, and pressure required to heat the material at the reduced pressure to remove moisture and air would be dependent upon the amount of powder being outgassed, the heat transfer capabilities of the container, the starting pressure in the container, the level of toxic and flammable vapors in the vapor space, the cost of the equipment required to achieve and operate at the reduced pressure and the amount of entrained moisture and air to be removed from the powder. So, one having ordinary skill in the art would have to take all of these variables into consideration when determining how long and at what temperature and pressure to heat the powder at reduced pressure. As such, time, temperature, and pressure are recognized control variables for heating and would have

been readily optimized as is routinely practiced in the art. (See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

As to claim 2, Van Slyke et al. teach mixing or blending the powder organic powder materials (paragraph [0020]). Implicitly the mechanism for mixing or blending would include a propeller or a turbine blade.

As to claim 3, Shi teaches the use of an overlapping range of 0.5 to 50 mole percent of the dopant component in the mixture (paragraphs [0037] and [0062]). Further, Van Slyke et al. teach that any range of dopant material may be selected for forming the mixture (Figure 9, step 904).

As to claim 4, Shi teaches employment of an inert atmosphere. It would have been obvious to one of ordinary skill in the art to use readily available nitrogen gas or argon gas as the inert gas.

As to claim 5, Van Slyke et al. in view of Shi teach the method of claim 1 as discussed in the 103(a) rejection above, but do not teach compacting the mixture in a range of pressures between 3,000 – 20,000 pounds per square inch. However, Van Slyke et al. do teach that powders have problems in their utilization in thermal physical vapor deposition due to having a relatively low density (paragraph [0009, lines 22-27]) and the fact that the material is difficult to heat due to low particle-to particle contact area (paragraph [0009, lines 27-41]) and that these facts may have a negative impact on the ability to outgas the material due to an inability to uniformly heat the material (paragraphs [000, lines 27-57]).

Further, Van Slyke et al. teach that pressure is applied to agglomerate the powder into a pellet (paragraph [0033]). Depending on the weight fraction of each material component and the specific materials employed, the pressure required to agglomerate the powder into a pellet will vary.

Therefore, one having ordinary skill would have to take these variables into consideration when determining the pressure to apply to the powder mixture to form a pellet. As such, pressure is a result effective control variable for forming a solid pellet that would have been readily optimized as is routinely practiced in the art. (See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

As to claim 6 Van Slyke et al. teach reducing the pressure before mixing. Additionally, it would have been obvious to one having ordinary skill in the art to provide desired operational conditions as early as possible to increase productivity and decrease the time required to produce the desired affect; in this case, reducing the moisture level.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (European Patent Application 1 274 136; published January 8, 2003) in view of Shi (European Patent Application 1 156 536; published November 21, 2001) as applied to claims 1-6 above, and further in view of Staniforth et al. (U.S. Patent Application Publication 2004/0047810; priority date November 30, 2000).

Van Slyke et al. in view of Shi teach the method of claims 1-6 as discussed in the 103(a) rejections above. Van Slyke et al. in view of Shi do not teach rotating the mixing

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mechanism in a first periodic motion at a rate in a range of 20,000 to 50,000 revolutions per minute. However, Staniforth et al. teach a conventional method of dry mixing powders with a high speed mixer in the range of 5,000 to 20,000 rpm. [paragraph 0069].

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention modify the combined teaching of Van Slyke et al. in view of Shi to mix the powders with the method taught by Staniforth et al. because one having ordinary skill in the art would have been motivated to find specific mechanisms to implement the mixing taught by Van Slyke et al. in view of Shi. The conventional method taught by Staniforth et al. would have been an obvious choice.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (European Patent Application 1 274 136; published January 8, 2003) in view of Shi (European Patent Application 1 156 536; published November 21, 2001) as applied to claims 1-6 above, and further in view of Beebe (U.S. Patent 6,543,928; issued April 8, 2003).

Van Slyke et al. in view of Shi teach the method of claims 1-6 as discussed in the 103(a) rejections above. Van Slyke et al. in view of Shi however do not teach rotating the container in a second periodic motion at a rate in a range of 10 to 60 revolutions per minute. However, Beebe teaches a method of mixing powders where in addition to using a mixing mechanism to mix the powder, he further rotates the container at a speed of 2 to 30 revolutions per minute (col. 5, lines 7-18).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention take the method taught by Van Slyke et al. in view of Shi to mix the powders and modify it with the method taught by Beebe because Beebe teaches that mixing powders using a rotating container with an agitator is frequently used and effective for mix dry chemical compounds (col. 1, 38-40) and because one having ordinary skill in the art would be motivated to find specific teachings on mixing methods in light of the combined teaching of Van Slyke et al. in view of Shi.

Although the claimed speed differs from the reference, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F. 2d 1575 16 USPQ2d 1934 (Fed. Cir. 1990).

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (European Patent Application 1 274 136; published January 8, 2003) in view of Shi (European Patent Application 1 156 536; published November 21, 2001) as applied to claims 1-6 above, and further in view of Renfro (U.S. Patent 6,910,799; filed November 14, 2002).

Van Slyke et al. in view of Shi teach the method of claims 1-6 as discussed in the 103(a) rejections above. The combined references however do not teach reciprocating the mixing mechanism by means of a pneumatic cylinder and a traversing bracket in a range of 30 to 60 cycles per minute.

However, Renfro teaches a method of mixing particulate materials (col. 1, lines 12-15) where an air cylinder (108) (col. 6, lines 15-18) attached to a cylindrical holding section (46) (col. 4, line 60) is used to cause a reciprocating motion of the mixing shaft (32) inside the container (see Figure 1). The cylindrical holding section traverses with the cylinder.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to take the method taught by Van Slyke et al. in view of Shi to mix the powders and modify it with the method of Renfro for the purpose as taught by Renfro of providing a quick, efficient, cleaner and convenient method of mixing (col. 1, lines 40-42).

Response to Arguments

Applicant's arguments filed April 17, 2006 have been fully considered and are partially persuasive. The Van Slyke et al. (U.S. Patent 6,797,314) and Shi (U.S. Patent Application Publication 2004/0016907) references have been withdrawn. They have been replaced with similar art that is not disqualified under 35 U.S.C. 103(c).

The remaining arguments are moot in view of the new grounds of rejection.

Conclusion

All claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-

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8937. The examiner can normally be reached on Monday - Thursday 7:00 - 4:45, alternating Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW

Jeff Wollschlager
Examiner
Art Unit 1732

June 26, 2006


CHRISTINA JOHNSON
PRIMARY EXAMINER
6/26/06